

Codigos en ASM

```
;;Calcular mediana en C
#include <stdio.h>
#include <stdlib.h>
#include <math.h>

#define N 16

extern double asmCalcularMediana(float *arr, int num);

int main(){
    float arr[N] = {2, 5, 3, 9, 6, 4, 11, 15, 20, 10, 13, 7, 8, 1, 12, 16};

    int aux;
    for (int i = 0; i < N; i++)
        for (int j = i + 1; j < N; j++)
            if (arr[i] > arr[j]){
                aux = arr[i];
                arr[i] = arr[j];
                arr[j] = aux;
            }

    for (int i = 0; i < N; i++)
        printf("%.2f ", arr[i]);
    printf("\n");

    double mediana = (arr[N / 2] + arr[(N / 2) + 1]) / 2.0;
    printf("La mediana en C es: %.2lf\n", mediana);

    float arr_asm[N] = {2, 5, 3, 9, 6, 4, 11, 15, 20, 10, 13, 7, 8, 1, 12, 16};

    printf("El valor de prueba de decimal en ASM es: %.2lf\n", asmCalcularMediana(arr_asm, N));
}
```

```
;;Calcular promedio en ASM
global asmCalcularPromedio
section .text

asmCalcularPromedio:

    mov     rax,     1
    cvtsi2sd xmm0,   [rdi]

loop:
    ;4 enteros o float
    ;8 double
    add     rdi,     4
    cvtsi2sd xmm1,   [rdi]
    addsd   xmm0,    xmm1

    inc     rax
    cmp     rax,     rsi
    jb     loop
```

```

cvtsi2sd    xmm2,    rsi
divsd      xmm0,    xmm2
ret

```

```

//calcular promedio en C
#include <stdio.h>
#include <stdlib.h>
#include <math.h>

#define N 16

double calcularPromedio(int *arr);
extern double asmCalcularPromedio(int *arr, int num);

int main(){
    int arr[N] = {}, aux = 0;

    for (int i = 0; i < N; i++){
        arr[i] = aux;
        aux++;
    }

    double prom = calcularPromedio(arr);
    printf("El promedio en C es: %.2lf\n", prom);

    prom = asmCalcularPromedio(arr, N);
    printf("El promedio en ASM es: %.2lf\n", prom);
}

double calcularPromedio(int *arr){
    double aux = 0;
    for (int i = 0; i < N; i++)
        aux += arr[i];
    return aux / N;
}

```

```

//calcular factorial en C
#include <stdio.h>
#include <stdlib.h>
#include <math.h>

int factorial(int num);
extern void asmEjercicio2(double *num);

int main(){
    int resultado = factorial(5);
    printf("El resultado del factorial de 5 en C es %d\n", resultado);

    double resultadoAlternativo = 5;
    asmEjercicio2(&resultadoAlternativo);
    printf("El resultado del factorial de 5 en ASM es %.1f\n", resultadoAlternativo);
}

int factorial(int num){
    int aux = 1;
    for (int i = 1; i <= num; i++)
        aux *= i;
}

```

```
    return aux;  
}
```

```
;;calcular factorial en ASM  
global asmEjercicio2  
    section .text  
  
asmEjercicio2:  
    movsd    xmm0,    [rdi]  
    movsd    xmm1,    [rdi]  
    mov      rax,      1  
    mov      rbx,      0  
    cvtsi2sd  xmm2,    rax  
    cvtsi2sd  xmm3,    rbx  
    subsd    xmm1,    xmm2  
  
    loop:  
        mulsd    xmm0,    xmm1  
        subsd    xmm1,    xmm2  
        ucomisd  xmm1,    xmm3  
        jne      loop  
  
    movsd    [rdi],    xmm0  
    ret
```